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APRIL 1983

Phase 2

Stage 2: Site Selection Work Program

DRAFT

Environmental Assessment of the Landfill Component of Halton's Solid Waste Management System

42

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(D R A F T)

HALTON ENVIRONMENTAL ASSESSMENT

Landfill Component of Solid Waste Management

Phase 2 - Stage 2 - Site Selection
Draft Work Program
April 1983

INTRODUCTION

Stage I of Phase 2 essentially comprised the identification and testing of the need for a landfill component in Halton's solid waste management system. Various waste management systems were examined with a view to reducing the dependency on sanitary landfill for solid waste disposal, if possible and desirable. All the potentially viable systems included some landfill component.

The requirement for sanitary landfill space over the next 20 years varies, depending upon the system, from a minimum of 5.7 million cubic yards to a maximum of 13.7 million cubic yards.

1. Purpose

The purpose of the second stage of Phase 2 - Formal Environmental Process - is to review landfill alternatives in Halton Region, within the framework of the landfill component of the preferred solid waste management system.

1.1 General Assumptions

We have made the following assumptions at the outset of Stage 2, based on the findings of the Stage 1 - Waste Needs and Systems Analysis:

- a preferred waste management system will be confirmed by Council, and thereby a general scale of landfill requirement can be determined from that decision; however, all potentially viable waste management systems in Halton require some landfill component;

- depending on the preferred system selected by Council, between 53%-95% of the total waste stream would be disposed of in a landfill site or sites in Halton over the 20 year planning period;

- range of landfill volume required varies between 5.7 million cubic yards to 13.7 million cubic yards (3 million-8 million tons), depending on the preferred system selected;

- the site selection process will be undertaken in 3 sub-stages - General Overview Analysis; Detailed Site Comparison; and Final Site(s) Evaluation;

- background information prepared by original consultants in 1976 (Dillon et al) will be updated and revised where appropriate, as long as that information is in a form that can be assessed in terms of its validity and completeness.

2. General Overview Analysis

Section 2 describes the framework of the General Overview Analysis, which is the first sub-stage in the site selection process. The purpose of the General Overview Analysis is to identify on a Region-wide basis potential areas within Halton which fulfill the requirements of the landfill component of the preferred solid waste management system.

The starting point for work at Stage 2 - Site Selection level is the entire Region of Halton. It should be noted that the General Overview Analysis involves elements of work that are common to all solid waste management systems with respect to the landfill component. As noted previously, all potentially viable systems require some landfill component even though the degree of landfill does vary depending on the preferred system selected.

2.1 Environmental Factors

This stage of the selection of landfilling areas will be based on common elements in all the potentially viable systems, which can be documented from a Regional perspective and which do not change regardless of the preferred waste management system selected. Under the Environmental Assessment Act, it is important that the appropriate definition of "environment" is applied to the site selection process, including the physical, social, cultural and economic environment of man. Therefore, is is our intention to undertake a screening process for the identification of potential areas for landfilling in Halton, based on a range of environmental factors which may, in the interpretation of those factors, suggest environmental constraints for the establishment of the landfill component.

The following list illustrates a range of general physical factors to be assessed in the General Overview Analysis; we deal with social, cultural and economic factors in subsequent sections of the General Overview Analysis:

- geology to indicate presence of an unstable sub-base (e.g. sinkhole areas);
- floodplain lands;
- absence of adequate cover material;
- presence of endangered species;
- potential for significant groundwater contamination;
- known archaeological sites and/or areas of high archaeological potential;
- presence of designated Environmentally Sensitive Areas;
- presence of Class 1, 2, 3 farmland or specialty crop lands;
- presence of important Regional aquifers.

It is important to note that the above factors are not considered absolute constraints to the extent that any single factor would automatically eliminate an area for further consideration at the stage of

comparing specific landfill alternatives. However, we intend to undertake the Overview Analysis by assessing the proposed factors to determine whether suitable areas for landfilling in Halton can be identified clearly from such an assessment. If there are no areas of the Region where all the factors can be avoided or in some way mitigated at the site comparison level, then it will be necessary to undertake a secondary review process, where the factors are re-evaluated and weighted according to relative importance. For the purpose of estimating time and budget for this work program it is not assumed that the secondary review process will have to be undertaken. It is only following the completion of the Overview Analysis that the need to "feedback" would be identified, and at that time the extent of reassessment clarified. By that time, also, the decision on the preferred system would have been made and the scale of the landfill component determined such that it can be used to assess whether the "suitable areas" are sufficient for the scale of landfilling needs for the planning period.

2.1.1 General Methodology

The evaluation of the above factors would be based primarily on the use of existing information including reports and background material for the constraints mapping prepared by earlier consultants (e.g. Dillon/Gartner-Lee), current land use maps and air photos, Conservation Authority reports and agricultural capability maps (1:50,000 series). Interviews with the original consultants, the Regional staff and external agencies would be required to obtain and/or confirm the data.

In Phase I we reviewed the constraint mapping technique employed by Dillon and Gartner-Lee to select what they believed to be favourable areas for sanitary landfills in Halton. In addition, we reviewed the process used by McLaren in 1974 and the arguments put forth by the Proctor and Redfern/Morrison-Beatty team relative to the proposed NSP location. The screening process adopted by the Dillon/Gartner-Lee team was used by them to identify areas where the threat of pollution to groundwater could be minimized and where other factors favourable to the

economic operation of a regional landfill prevailed. Some changes in philosophy related to sanitary landfill have been identified during the last few years which we feel should be considered now, when the Environmental Assessment is being conducted. For instance, we believe that there is an important concern in Halton and elsewhere related to removal of high quality farmland without reason. We have taken note of the concerns expressed by the rural community in Halton that "damaged" land, such as quarries, receive consideration as potential landfilling before concluding that good agricultural land should be used for the landfilling component of Halton's solid waste management system. We recognize that there are quarries and areas of non-agricultural land in Halton which might prove satisfactory for landfilling under certain circumstances. Therefore, we propose to re-consider the steps in the original area selection process and examine in more detail the factors used by earlier consultants for selection of potential landfill areas. The following general questions would be addressed in the review of the original selection process:

a) Are the factors related to the physical, economic, social and cultural environment used in the original selection process relevant?

b) Were any factors overlooked in terms of the Environmental Assessment Act now being considered?

c) Were the factors used defined adequately (e.g., definition of major overburden aquifer)?

d) Do we agree with the defined factors; if not, do we feel justified in modifying them?

e) Is there sufficient data to assess each of the factors which are determined as being relevant in the context of Halton in the Environmental Assessment?

During the Overview Analysis, since we are dealing with the entire Region, we do not expect to do any significant amount of sub-surface testing, and intend to rely heavily upon existing data. In consideration of quarries and non-agricultural land, we will be examining closely the drainage situations and the potential for using groundwater flow and surface drainage to contain leachate, should an area be used for sanitary landfilling.

To satisfy the types of issues that arose in Stage 1 and to provide information needed to complete the Overview Analysis, the following questions regarding technical information and the site selection process will be addressed during the course of the Overview Analysis at different stages:

a) What level of environmental security is required for landfilling (degree of contaminant containment)?

b) What are the potential and future uses of water resources in areas planned for future development (e.g., planned servicing)?

c) Are there hydrogeologic/hydrologic sensitive areas designated in the Region?

d) Once the decision is made during the Overview Analysis, what is the minimum area required for a viable landfill component in terms of that preferred waste management system? Consideration would be given to a) single site or b) multiple sites, so that we can assure ourselves that smaller areas of suitable land are not disregarded.

2.1.2 Procedures

a) Liaise with the Region and Ministry of the Environment to ascertain the level of environmental sensitivity that will be required for landfilling within the Region.

b) Liaise with Ministry of the Environment, Conservation Authorities, N.E.C., Region of Halton to identify environmentally sensitive areas and assess their significance.

c) Review with Dillon/Gartner-Lee their data base and evaluation factors used to identify potential landfill areas.

d) If necessary, delete or modify site evaluation factors. Incorporate current methods of landfill site selection and revise constraints mapping analysis. Areas for updating of physical factors, as an example, could include:

- Identifying water serviced areas and areas that may be serviced in the future.
- Additional water well information
- Consideration of areas deemed to be hydrogeologically sensitive.
- Consideration of quarries or damaged lands for landfilling.
- Engineerability of sites in various hydrogeologic settings.
- Potential for and future uses of water resources.

Other factors that would be considered include:

- Topography
- Floodplains, wetlands
- Aquifer distribution, overburden and bedrock
- Surface drainage
- Depth to bedrock for cover material and/or aquifer protection
- Estimate groundwater flow systems
- Permeability characteristics of earth materials, attenuation potential
- Potential for signicant groundwater contamination
- Potential for significant surface water contamination

e) Once the decision on the preferred waste management system is made, the requirement for landfill volume will be compared with the general availability and size of potential landfilling areas.

2.2 Additional Factors for the Establishment of a Landfill Component

While the foregoing discussion is primarily oriented toward physical factors, a proper environmental assessment cannot be undertaken without recognition of social, economic and cultural factors as well. However, physical, and particularly hydrogeological, factors are important to establish on a Regional basis in the Overview Analysis to prevent the possible selection of areas that could be unsuitable or unsound for landfilling from a hydrogeologic viewpoint. This is why we started at the outset of the work program with an apparent emphasis on physical factors. We are, at this point, acknowledging the need to consider social, economic and cultural factors also in the Overview Analysis.

The following factors also would be addressed in the Overview Analysis:

- proximity to waste centroid(s) determined in the waste zone analysis;
- accessibility to sewage treatment facilities;
- transportation accessibility (existing and planned infrastructure);
- opportunity to rehabilitate existing damaged land.

These types of factors are important in considering the haul costs associated with sanitary landfill alternatives, and should be considered in the locational relationship and general engineerability of potential landfill areas.

2.2.1 Social Factors

We also propose to screen the following social factors in the General Overview Analysis:

- planned use for the area(s);
- proximity to existing and proposed built-up areas (e.g. extent of planned urban areas);
- proximity to airports;
- proximity to sensitive institutional and community receptors (e.g. schools, hospitals, churches);
- visual effects (e.g. presence of tourist areas; special purpose areas such as Provincial Park).

The level of detail for social input to the General Overview Analysis will involve the following:

- review existing and planned future land use in area municipalities based on existing data, with field checks where necessary to confirm information at an "overview" level of detail;
- identify from secondary material significant social services and institutions that might be particularly sensitive to the impacts of a landfill operation;
- identify from available information important scenic features in the Region;
- develop general guidelines from a social perspective for determining acceptable landfill areas given the location of those services and institutions;
- apply these guidelines to screen potential landfill areas.

2.3 Waste Zone Analysis

For the purpose of estimating haul costs in the relationship to potential landfilling areas, we will refine the location of waste centroids from the Stage 1 analysis based on the following:

- Basic Planning Unit data (Region's classification) for existing and projected population and employment (to be prepared by Regional Planning and Public Works Department);
- waste generation factors by zone for 1976 to 1981, 1986, 1991, 1996, and 2001;

- waste quantities by zone (BPU) (to be determined through a more detailed examination of existing and planned land use and characteristics of industrial waste generation from a locational analysis of the 1983 Industrial Waste Survey).

The population and employment data by waste zone (Basic Planning Unit) should be available to the consultant at the outset of Stage 2 to allow the analysis to be completed before the Overview Analysis is completed and the site comparison in the second sub-stage is undertaken.

Waste quantities (tons per year by zone) will be converted to daily tonnages, then used to determine the number of haulage vehicles per day leaving each zone. The most probable haul routes will be identified from the municipal centroid(s) to potential landfill areas. From this analysis, haulage vehicles can be assigned to the Region's road network and the resultant impacts determined (haulage costs, road upgrading requirements, potential traffic noise, etc.).

2.4 Review of Evaluation Factors

The factors discussed in Sections 2.1, 2.2 and 2.3 will be circulated to the Region's mailing list. An Open House would be held to review the factors which we intend to apply to the entire Region to identify potential landfill areas.

Results of the public review of these factors, and responses from the mailing list, will be evaluated and revisions made as necessary. The circulation and review process should occur at the outset of Stage 2 in order to allow time for revisions to the factors prior to the evaluation.

2.5 Report on the General Overview Analysis

The results of the general overview analysis will include broad areas defined as potential for the containment of landfill areas, and described in a report together with:

- waste zone analysis;
- constraints analysis applying evaluation factors for the physical, social, economic and cultural environment;
- constraints mapping showing locations considered unsuitable for landfilling;
- requirement for secondary review process, if necessary;
- identification of suitable landfilling areas;
- brief/report on public open house and mailing list response to the evaluation factors, and revised factors if necessary;
- draft of site evaluation criteria for second screening/detailed site comparison level of assessment.

The General Overview Analysis report would be presented to the Solid Waste Management (SWM) Committee before proceeding with the detailed comparison of specific sites. We feel it is important for the SWM Committee to review and discuss the work done by the study team at each sub-stage in Stage 2. In addition, the results of the Overview Analysis will allow the study team to better assess the validity of using any of the original Dillon areas and/or sites.

3. **Detailed Site Comparison**

Detailed criteria would be applied to "potential landfill areas" identified in the General Overview Analysis. Activities involved in this part of the site selection process include:

- identification of alternative site-specific locations for landfilling from areas identified in the General Overview Analysis;
- comparison of advantages and disadvantages among alternative landfilling site(s);
- identification of mitigating measures to reduce potential adverse impacts of landfill alternatives.

3.1 Site Evaluation Factors

Site evaluation factors will be used to identify potential impacts among alternative landfill sites. Examples of the types of factors that would be applied are as follows:[1]

- Hydrogeology (e.g. groundwater quality and flow, relationships of groundwater to surface water);
- Hydrology (e.g. surface drainage study, collection and analysis of water samples from local and surface streams);
- Physical terrain analysis (e.g. geology and physiography (generalized), surface relief, prevailing wind speeds);
- Biological terrain analysis (e.g. plant community type and importance, animal species, type of aquatic communities, and dominant plant species);
- Engineering (e.g. presence of utilities/easements, design and operation concepts and costs, impacts on transportation network);
- Economics (e.g. impact on property values, acquisition costs, capital and operating costs, transportation and road costs);
- Social (e.g. aesthetic and visual impacts, perceived changes on community lifestyle, potential land use conflicts, noise and vibration, safety, impact on outdoor recreation, tourist areas);
- Cultural (e.g. disruption of potential archaeological and/or historical sites);
- Agriculture (e.g. use of better quality or specialty soil areas, disruption of tile and surface drainage systems, conflicts with farm machinery and livestock, severance of farm properties and viability of farm operations, effects on water quality and quantity for agricultural uses, and vermin control).

[1] These are representative factors to be refined and circulated to the Region's mailing list. Revisions will be done as required.

3.2 Methodology

Information that would most likely be required for detailed evaluation of alternative sites is listed below:

- further review of existing site-specific documents and discussions with various public and private agencies and individuals;
- geologic investigations, as required;
- air photo interpretation;
- site visits including visual inspection for wildlife habitats/aquatic survey;
- water sampling on-site and chemical analysis;
- field survey and testing of identified potential archaeological sites and/or heritage resources;
- property evaluation of landfill site(s) by appraiser;
- community survey for social impact assessment;
- inventory and evaluation of groundwater conditions (on-site and off-site);
- subsurface exploration program to assess hydrogeological suitability;
- instrumentation, field testing, lab work, water and soil samples, pumping tests, as required depending on site(s) selected;
- site specific capital and operating costs for landfilling;
- municipal finance analysis re: grants, debentures, mill rates, reserve funds, property purchase;
- indirect and direct cost of financial impacts.

It should be noted that the requirements of a detailed comparison of landfill site(s) are influenced primarily by site-specific conditions and, therefore, an accurate estimation of the level of detail involved in the above requirements cannot be determined until specific landfill site(s) are identified. For the purposes of this work program, we have included the above items as <u>representative</u> of the type of analysis that would be undertaken.

3.3 Review of Site Evaluation Factors

As in the General Overview Analysis, the site evaluation factors would be circulated to the Region's mailing list. The public will also have an opportunity to comment on the factors that would be used to evaluate specific landfill site(s), at the relevant Open Houses and Workshop sessions described in Section 4. The results of the Open Houses and Workshops will be summarized in a discussion paper for review by participants and interested parties.

3.4 Review of Impacts and Possible Mitigating Measures

Site evaluation factors, described in general terms in Section 3.1, would be applied to alternative landfill site(s) to determine the range of potential impacts. These potential impacts and suggested mitigating measures would be explained for review and comment at Public Open Houses and Workshops in the vicinity of alternative landfill site(s).

3.5 Report on Alternative Landfill Site(s)

The results of the detailed site comparison, review of potential impacts and possible mitigating measures, and the public's input will be presented in a final report to the Solid Waste Management Committee.

Recommendations on the preferred landfill alternative(s) will be presented to the Committee. We believe that input from SWM is important at this point, for the following reasons:

- to provide an opportunity for Committee to review the technical analysis by the study team, and to make Committee aware of public input, and comments of external agencies (public and private);
- to provide an opportunity for clarification of the site selection process and final results;
- to provide an opportunity for discussion with the study team on preferred alternative(s); and

. to provide direction from Committee on the preferred alternative(s) for further detailed investigation and public input from affected group(s). (See Section 4.5.)

3.6 Final Site(s) Evaluation

Once the preferred landfill alternative(s) has been determined by Council, the provision for public open houses, sub-section 4.5, will be completed. In addition, we anticipate that there may be some requirement(s) for further detailed investigations of a hydrogeological or geologic nature in preparation for environmental approval of the preferred landfill alternative(s). The specific requirements of the final site(s) evaluation would be determined once the preferred landfill alternative(s) has been confirmed by Regional Council.

4. Public Participation Program

The public participation program follows very closely the procedures outlined in the Revised Work Program, November, 1982, with additional public input during the General Overview Analysis. Figure One outlines the proposed program during Stage 2, Phase 2. The opportunities for public input are described as follows:

4.1 Review of Site Evaluation Factors

An Open House will be held to review the expanded evaluation factors (Sections 2.1, 2.2, 2.4) applied to the Region as a whole to identify potential landfill <u>areas</u>. Prior to the Open House, the factors will be circulated for comment to the mailing list. The purpose of this session is to provide an opportunity for the review of the evaluation factors and <u>not</u> to provide data on individual sites.

4.2 Collect Social Impact Data, Identify Community Concerns and Review Site Evaluation Factors

The following public participation techniques will be used <u>once potential landfill sites have been identified</u>:

FIGURE ONE

PUBLIC PARTICIPATION PROGRAM - STUDY STAGE 2

COMPONENTS OF STAGE 2	TASK REQUIRING PUBLIC INPUT	PUBLIC PARTICIPATION TECHNIQUES	AUDIENCE
General Overview Analysis	. review of evaluation factors	. circulate factors to mailing list for comments . Open House (1 location)	. general public . involved interest groups
Detailed Site Comparison	. collect social data on affected communities, identify community concerns, review and revise site evaluation factors	. Community Survey . Open House (1/site) . Workshop (1/site)	. directly affected residents . general public . involved interest groups
Detailed Site Comparison	. review identified community concerns and site evaluation factors	. circulate discussion paper	. involved interest groups
Detailed Site Comparison	. review predicted impacts at each site(s) and discuss possible mitigation measures	. Open House (1/site) . Workshop (1/site)	. general public . involved interest groups
Final Site(s) Evaluation	. review preferred site(s)	. Open House (3/site)	. involved interest groups . general public

A questionnaire will be circulated to all residents in the immediate vicinity of the potential site(s). The questionnaire will collect factual data from the affected households that is required for the impact assessment. The survey will also identify community concerns regarding the proposed landfilling. The questionnaires will be delivered to the households by an individual representing the study team who will explain the purpose of the survey. Questionnaires will be returnable by mail.

Open Houses will be held in the vicinity of potential site(s) for the public's review of the process used to screen the Region and arrive at potential sites for detailed investigation, as well as the methodology and factors being used to evaluate each of the potential sites. These Open Houses will also allow individuals and organized interest groups to identify concerns or issues they feel should be addressed in the detailed site evaluation.

Workshops with representatives of the major affected parties at each potential site will be held in addition to the Open Houses to provide an opportunity for a more intensive and detailed review of the study methodology and evaluation factors. The participants at these workshops will be asked to review the evaluation factors and if necessary expand or revise these factors; they will be asked to indicate their views on the relative priority of various criteria; and they will be asked to review and comment on the methodology for evaluating sites. This input will be recorded and any differences between the participating groups will be identified. The input will assist the study team in refining their evaluation factors and methods for use in the subsequent analysis.

4.3 Discussion Paper on Site Evaluation Factors and Community Concerns

The results of the above workshops will be summarized in a discussion paper and circulated to the workshop participants for their review.

4.4 Review of Predicted Impacts and Discussion of Mitigation

Open Houses will be held to review the specific site(s) evaluation data compiled on each of the potential sites. The anticipated impacts of the landfill at each site would be explained for review and comment. Opportunities for decreasing potentially negative impacts through mitigation measures would be identified for public review, comment and possible elaboration.

Workshops will be held with representatives of the major affected parties at each of the potential sites, and the identified impacts and potential mitigation measures will be reviewed at that time.

4.5 Review Preferred Alternative(s)

An Open House will be held in the vicinity of the preferred site or sites to review the rationale for selecting the site(s), the recommended mitigation measures and the resulting impacts. This Open House will operate intermittently over a three-day period to provide extended opportunities for public review.

5. **Meetings**

The following meetings would occur in Stage 2 to obtain background information and to clarify existing reports:

- regional staff - to collect and confirm data for the General Overview Analysis and detailed Site Comparison;
- original consultants - General Overview Analysis (estimated included for study team in Section 7) and detailed Site Comparison, including review of project files and discussion with consultants, to clarify information. (Budget does not include expense for original consultants; to be authorized separately by Regional Study Coordinator.)
- external agencies - data collection in General Overview Analysis and detailed Site Comparison;

. Solid Waste Management Committee (two each for General Overview Analysis, Site Comparison and Selection of Preferred Alternative(s)).

Requirements for meetings in the General Overview Analysis are tied to the work program outlined in Section 2 and are shown in the estimated budget (Section 7) for the study team.

6. Scheduling

The actual timing for completion of Stage 2 depends upon the following factors:

- Council's determination of the preferred Solid Waste Management System;
- the degree of public response in Open Houses and Workshops;
- the complexity of potential landfill site(s) and need for detailed geologic and hydrogeological investigations;
- the number of potential landfill site(s) identified.

Given the above factors, we estimate a minimum of 2 months for the General Overview Analysis based on the assumption that a secondary screening will not be necessary; and 3-4 months for the detailed site comparison based on the assumption of having to assess three alternative sites in distinct areas of the Region, but not assuming extremely complex sites.

7. Fees

Fees are included for the following general components in Stage 2:

. preparation of factors and analysis for the General Overview Analysis;
. meetings with regional staff and external agencies (as noted in separate man-day estimates);
. meetings with original consultants (as noted in separate man-day estimates);
. study team/coordination meetings;

. preparation of report on General Overview Analysis;
. Public Open Houses and Workshops.

7.1 Estimated Budget Requirements for Stage 2, Phase 2

A breakdown of the estimated budget for the General Overview Analysis is shown on the following pages. Should the scope of the work program outlined herein increase in the course of Stage 2 due to unforeseen circumstances such as additional requests for comments from external agencies and/or interest groups or subsequent analysis from public feedback, we would require the expansion of the budget framework provided herein.

Work on the second sub-stage in the site selection process will depend on the nature of sites and the number of sites selected for detailed site comparison. Therefore, budget estimates can only be determined following the General Overview Analysis.

7.2 Specialists

The following specialists will be required in the detailed site comparison stage of Stage 2:

. Site Rehabilitation to Agriculture - (Dr. E. McIntosh, University of Guelph)
. Land Appraiser - to be provided
. Taxonomist (if required)
. Quaternary Geologist (Dr. P. Carroll, University of Waterloo) to assist Mr. J. Nunan

Detailed budget estimates for these specialists would be prepared once the number of sites has been identified. In addition to those noted above, original specialists identified in the Proposal will be maintained. These specialists are as follows:

. Museum of Indian Archaeology (Dr. Wm. Finlayson)
. Pollutech Limited (Dr. J. Norman)

The above specialists would be also involved once specific landfill site(s) have been identified. A detailed budget would be prepared following the General Overview Analysis when it is clear what are the number of sites involved.

7.3 Meetings with Interest Groups

We would attend specific meetings with interest groups only at the request of such groups to the Halton Region Study Coordinator or his designated alternate. Therefore, the estimated budget for Stage 2 herein does not incorporate the cost of these meetings.

This procedure is in accordance with our agreement with the Region, D.P.D. 175/82, 82 09 02.

7.4 Contingency Costs

We have attempted to design the Stage 2 work program with considerable flexibility for external input to the site selection process in the Environmental Assessment. This flexibility may be manifested through additional meetings with interest groups, suggestions from the public to undertake investigations of new areas of interest, and perhaps even the need to re-open aspects of the alternative methods of solid waste disposal. With respect to the latter, we note the following comments of the Ministry of Environment on the evaluation criteria for alternative waste disposal systems:

> "While it is acceptable at this point in the planning process, to narrow the scope of the alternatives available to solving Halton's solid waste problem to landfill, one cannot state that landfill is, and will continue to be, regardless of the results of further planning, NEEDED. The results of the more detailed evaluation of the advantages and disadvantages of the alternative methods of achieving the landfill alternative may dictate that the criteria which was used to focus planning on landfill must be re-examined. . . . it is important to establish that environmental assessment is not a lock step planning process. One may eliminate alternatives which appear to be

unsuitable, however, the results of future more detailed planning may indicate a need to re-examine the basis for rejecting alternatives earlier on."

We believe, based on the inherent nature of the Environmental Assessment process as reiterated above, that the possibility clearly exists that unforeseen events might occur during Stage 2 which could effectively alter the timing and budget estimates provided to you in the Stage 2 work program. Therefore, we have provided our best estimate at this time for the completion of the General Overview Analysis but the utmost amount of flexibility must be permitted in terms of the timing and budget to allow for unforeseen costs beyond the scope of work outlined in the proposed work program. As noted earlier, a separate budget for the site comparison stage will be completed following the General Overview Analysis.

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WP 22

Estimated Budget for General Overview Analysis

Project Management

	Total Man-days	Budget Estimate
. review of evaluation factors for General Overview Analysis	1	$ 675
. meetings with area municipalities to review Stage 2 work program and/or evaluation factors	3	2,025
. review of study team responses to comments on evaluation factors	1	675
. review of draft report to SWM Committee on General Overview Analysis	3	2,025
. liaison meetings with Regional Staff (5)	5	3,375
. study team meetings (2)	2	1,350
. public open house (2)	2	1,350
. workshops		As requested (See meetings with interest groups)
. meeting with Solid Waste Management Committee (2)	3	2,025
. review of external reports, regular correspondence	5	3,375
. review of revised draft report to SWM Committee	3	2,025
	28	18,900

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Estimated Budget for General Overview Analysis

WP 23

Project Planner

	Total Man-days	Budget Estimate
• review of existing and future land use in area municipalities	8	$ 2,400
• liaison with Project Economist/Project Engineer on waste zone analysis from existing data sources	2	750
• meeting with original consultants to confirm and obtain land use data (1)	1	375
• review of relevant planning and environmental policies which apply to Halton (e.g. Regional Official Plan and Area Municipalities Official Plans, Provincial Policies)	5	1,500
• review of anticipated development activity from Regional data on plans of subdivision (review of Regional data	2	600
• overview of sites and/or areas of archaeological potential (write-up only information provided by Museum of Indian Archaeology	1	375
• preparation and coordination of evaluation factors and descriptions for circulation to mailing list	3	1,125
• revisions to evaluation factors and review of responses	2	750
• preparation of responses to comments from external agencies/interest groups	4	1,500
• preparation and coordination of draft report to SWM Committee on General Overview Analysis	10	3,750
• liaison and meetings with Regional staff(s) (5) study team meetings (2)	7	2,625
• public open house (including preparation of displays (3) and meeting attendance (2)	5	2,550
• workshops		As requested
• review of external reports (e.g. (Committees and regular correspondence	2	750
• meetings with SWM Committee (2)	2	750
• revisions to draft report for General Overview Analysis	5	1,875
	59	21,675

D R A F T

WP 24

Estimated Budget for General Overview Analysis

Biophysical Terrain Analysis

	Total Man-days	Budget Estimate
. review of designated Environmentally Sensitive Areas from existing Regional data	5	$1,500
. discussions with Conservation Authorities to confirm current conditions in ESA's and presence of endangered species	2	600
. meeting with original consultants to review environmental data on potential landfilling areas (2)	2	1,000
. responses to comments from external agencies/interest groups	3	1,500
. study team meetings (2)	2	1,000
. meetings with SWM Committee (2)	2	1,000
. public open house (2)	2	1,900
. workshops (as requested)	—	—
	18	8,500

D R A F T

WP 25

Estimated Budget for General Overview Analysis

Project Hydrogeologist

	Total Man-days	Budget Estimate
. review of Dillon/Gartner-Lee data base for constraints mapping and original selection process	5	$ 2,400
. preparation of evaluation factors and revisions	5	2,125
. public open house (2)	2	1,000
. meeting with SWM Committee (2)	2	1,000
. liaison with Ministries & Region to determine landfill security requirements and sensitivity constraints	3	1,000
. identify water serviced areas and determine proposed servicing	1	300
. inventory well data and consider hydrogeologic sensitivity and delimit major aquifers	11	3,600
. identify low grade agricultural land areas	1	300
. identify and study in detail quarries	6	2,200
. consider engineerability of various hydrogeologic areas	2	700
. determine present and future potential water uses	2	700
. map topography, flood plains, wetlands, Karst, areas of thin overburden	3	900
. map surface drainage	1	300
. map overburden thickness for cover material and/or aquifer protection, soil permeability, attenuation potential	4	1,300
. estimate regional groundwater flow systems	3	1,000
. study and discuss potential for ground-water and surface water pollution	4	1,400
. study team meetings (2)	2	1,000
. report preparation and presentation	10	3,700
	67	24,925

D R A F T

Estimated Budget for General Overview Analysis

Project Economist

	Total Man-days	Budget Estimate
. disaggregation of waste volumes forecasts from Stage 1 by area and year; discussion with Regional staff	4	$ 2,700
. develop assumptions about waste generator locations and discussion with Regional staff	1	675
. liaison with Project Engineer/Project Planner	2	1,350
. preparation of haul cost assumptions to municipal centroid(s)	2	1,350
. report preparation	2	1,350
. preparation of responses to external agencies/interest groups	1	675
. meetings with SWM Committee	2	1,350
. study team meetings (2)	2	1,350
. public open house (2)	2	1,350
	18	12,150

WP 27

D R A F T

Estimated Budget for General Overview Analysis

Project Engineer

	Total Man-days	Budget Estimate
. review of existing Regional transportation study data on origin-destination by zone	2	$ 800
. liaison with Project Planner/Project Economist on land use and waste generation data	2	800
. determination of waste centroid(s) by zone and haul cost assumptions from municipal centroid(s)	3	1,200
. meetings with MTC regarding status of highway planning and phasing . meeting with Regional Public Works Department re: Regional road improvements	1	400
. report preparation/exhibits	1	400
. preparation of evaluation factors and review of comments from external agencies/interest groups	2	800
. meetings with SWM Committee (2)	2	800
. study team meetings (2)	2	800
. public open house (2)	2	800
. workshops		As requested (See Section 7.3)
	17	6,800

D R A F T

WP 28

Estimated Budget for General Overview Analysis

Public Participation

	Total Man-days	Budget Estimate
. preparation and attendance for public open houses	5	$1,900
. meeting with SWM Committee (2)	2	900
. study team meetings (2)	2	900
. response to comments from external agencies/interest groups	3	1,350
	12	5,050

Social Impact Assessment

. identify services/institutions and preparation of report	6	$,1725
. develop S.I.A. guidelines	3	1,150
. apply guidelines	3	1,150
. study team meetings (2)	2	1,000
	14	5,025

Estimated Budget for General Overview Analysis

Disbursements

To be billed at cost, including mileage, printing of report(s), hand-out material for Public Open Houses, courier delivery; duplicating of original reports, articles, etc.